

RECORDS AND DESCRIPTIONS OF
MEGACHILID BEES FROM TEXAS
(Hymenoptera)

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In previous papers¹ the thesis was developed that several groups of megachilid bees are confined to the westernmost deserts of North America, immediately east of the great mountain divides of central and southern California. This idea was based on extensive collecting in California and some collecting in Arizona by the author, Timberlake and others, and extensive collecting in New Mexico and Colorado by Cockerell. Of particular importance were Cockerell's collections from southern New Mexico, made in desert areas similar in many ways to the Californian deserts. His material lacked the groups involved.

In the spring of 1949 the author, in company with his wife and Doctor and Mrs. R. H. Beamer, spent a week collecting in western Texas and obtained in these easternmost North American deserts members of several groups once thought to be confined to the western desert or at least concentrated there. Such groups are *Anthocopa* of the subgenera *Phaeosmia* and *Eremosmia*. There remain several of the groups (e. g. *Proteriades* and two subgenera of *Ashmeadiella*) which are probably actually confined to the far west, but further collecting will be necessary to establish this. It becomes obvious that Cockerell's collecting in southern New Mexico was not sufficiently extensive to be used as a basis for zoogeographic generalizations, at least in connection with bees which fly in the spring.

Except as otherwise stated types of new forms are deposited in the Snow Entomological Collections, University of Kansas.

ANTHOCOPA (PHAEOSMIA) RUBRELLA Michener, 1949

It is now certain that the flowers on which the type series of this species were taken at Dryden, Texas, were a species of *Dalea*.

Additional records, all from Texas, are as follows: Marathon, April 13, 1949, on *Dalea argyraea*; Cooper's Store, Big Bend Na-

¹ Michener, C. D., 1939, A revision of the genus *Ashmeadiella* (Hymen., Megachilidae), Amer. Midland Nat., 22:1-84; 1943, The American bees of the genus *Anthocopa* with notes on Old World subgenera (Hymenoptera, Megachilidae), Ann. Ent. Soc. Amer., 36:49-86; 1944, The distribution of the osmiine bees of the deserts of North America, Amer. Nat., 78:257-266.

tional Park, April 11, 1949, on *Dalea neomexicana*; Sanderson, April 13, 1949, on *Dalea formosa* (all collected by R. H. Beamer and C. D. Michener).

The Sanderson series of two males and two females is interesting in that one specimen of each sex is entirely without red on the abdomen, and in the remaining female the red is very dark, particularly on the third metasomal tergum. The remaining male is fully as red as specimens from other localities. The absence of red in part of this series is possibly an intergradation toward *A. maryae*, but the clypeal margin is typical of *rubrella*.

ANTHOCOPA (PHAEOSMIA) MARYAE Michener, 1949

Three females, Quemada, Texas, on *Dalea pogonathera*, April 14, 1949, (R. H. Beamer, C. D. Michener.)

Anthocopa (*Phaeosmia*) *daleae* Michener, new species

This species, which raises the total number of known species of *Phaeosmia* to ten, resembles *rubrella* and *maryae* in the broad apical flange of the sixth metasomal tergum of the female, but differs from them as well as from all other species of *Phaeosmia* by having a strong longitudinal median carina on the clypeus and by having the apical margin of the clypeus feebly trilobed (fig. 7), the lobes being the angles which demark the truncation and a median convexity between them. The male differs from that of *rubrella* in the large second metasomal sternum, which reaches the seventh tergum when the abdomen is in repose. In the key to the males of *Phaeosmia* (Michener, 1949, Jour. Kansas Ent. Soc., 22:54) *daleae* runs to *enceliae* if the rounded rather than emarginate second sternum is ignored.

Female: Length 6 mm. (varying to 5.8 among paratypes). Black, pubescence dull white, ochraceous to light fuscous on lower half of clypeus and dorsum of head and thorax; tufts of hair beneath clypeal margin orange but very small, not exceeding clypeal margin; face rather densely pubescent to above level of antennae; mesepisterna and marginal portions of scutum and scutellum rather densely pubescent. Inner margins of eyes converging below. Punctuation of head and thorax rather uniform and coarse, that of area immediately in front of anterior ocellus finer and dense, that of lower two thirds of clypeus also fine and dense except for the longitudinal median raised carina which marks this part of clypeus; lower end of carina low and narrow, upper end merging into rather coarsely punctate upper third of clypeus; clypeal truncation with impunctate but not thickened margin which is brownish; truncation longer than distance from its end to lateral angle of clypeus; median portion of

truncation slightly convex; distance between posterior ocelli slightly greater than distance from one of them to eye margin or to posterior edge of vertex; median ocellus about 1.5 times as far from antennal bases as from posterior edge of vertex; genal areas narrower than eye seen from side. Mandibles feebly dark red subapically, less than three times as long as greatest breadth, over three times as long as narrowest medial breadth, distance between first and second teeth less than that between second and third, margin between first and second teeth a V-shaped notch, that between second and third arcuate, subapical inner swelling absent; maxillary palpi longer than greatest width of galea, five-segmented, second segment longest, first and third subequal, slightly shorter, fourth slightly shorter than third, fifth very small and slender; first segment of labial palpus about 0.7 times as long as second. Thoracic punctation similar to that of vertex; tegulae smooth, translucent dark testaceous. Legs black, tibial spurs pale brown. Wings slightly dusky, veins and stigma black. Abdomen black, posterior margins of terga feebly brownish; metasomal terga one to four with conspicuous apical bands of white pubescence, somewhat narrowed medially on first and second terga; sixth tergum somewhat pruinose, more finely and closely punctured than dorsal portions of first four terga; sixth tergum with apical flange, projecting at an angle to disc of tergum; scopa short, dull white, that of apical half of sixth metasomal sternum consisting of hairs which are bent subapically.

Male: Length 5.5 mm. (varying to 5.2 mm. among paratypes). Similar in appearance and punctation to female but punctures of entire clypeus and supraclypeal area fine and dense, those in front of anterior ocellus not so; face more densely covered with white pubescence; clypeus without longitudinal carina, margin transverse, coarsely denticulate, median portion with three large denticles, adjacent parts of margin with two denticles on each side. Mandibles bidentate, outer tooth the longest. Abdominal punctation and pubescence similar to that of female; sixth metasomal tergum with a narrow projecting flange produced to a median slightly obtuse angle and to a small rounded lobe at each side; seventh tergum small, brown, margin rounded laterally, straight medially; first sternum thickened, posterior margin straight; second sternum large, covering succeeding sterna, posterior margin broadly rounded, reddish brown; third sternum with a broad squarely cut emargination with a fringe of long hairs only medially; fourth to sixth sterna entire, broadly rounded, margin of fifth more clearly straight than others; seventh sternum with apical emargination; eighth with apex obtuse.

Holotype female, *allotype* male, and three female and two male *paratypes*: COOPER'S STORE, BIG BEND NATIONAL PARK, TEXAS, on *Dalea neomexicana*, April 11, 1949 (R. H. Beamer, C. D. Michener). One female is from *Phacelia popei* but was not collecting pollen. One female *paratype*: Sanderson, Texas, on *Dalea formosa*, April 13, 1949 (R. H. Beamer, C. D. Michener).

This is the third Texan species of *Phaeosmia*. All are smaller than the more western species of this subgenus, but *daleae* in particular is closely related to the western group of species.

Anthocopa (*Eremosmia*) *beameri* Michener, new species

This is a species of typical *Eremosmia*, a group of bees hitherto known only from the California deserts. It has the appearance of a small specimen of *A. robustula* (Cockerell), from which it differs strikingly in the more nearly equidistant mandibular teeth of the male, in the coarsely punctured clypeus of the female with the upper portion shining, convex, with widely separated punctures, and in the rounded subapical inner mandibular swelling of the female. Because of the swollen upper part of the clypeus, the female might run to *laevibullata* in the key (Michener, 1943, Ann. Ent. Soc. Amer., 36:67). It differs from that species by the equidistant mandibular teeth of the female, among many other characters.

Female: Length 6.5 mm. (varying to 7.0 mm. among paratypes). Black, pubescence dull white, ochraceous on dorsum of head and thorax, tufts of hair beneath clypeal margin large, orange; sides of face and supra-antennal area rather densely pubescent to level of median ocellus, sides and dorsum of thorax also rather densely pubescent. Inner margins of eyes parallel. Punctuation of head and thorax fine and dense, the vertex and supra-antennal areas particularly so; supraclypeal area more coarsely and sparsely punctate, especially below; clypeus with upper two thirds strongly bulging, coarsely punctured, with punctures widely separated especially medially where there is a longitudinal zone which is impunctate or nearly so; lower third of clypeus closely and rather finely punctate except for the impunctate, thin margin of the truncation; margin of truncation slightly shorter than distance from end of truncation to lateral angle of clypeus, angles demarking truncation rounded; distance between posterior ocelli subequal to distance from one of them to posterior margin of vertex and to eye margin; anterior ocellus with its anterior margin slightly nearer to antennal bases than to posterior edge of vertex; genal areas narrower than eyes seen from side. Mandibles dark red subapically, less than 2.5 times as long as greatest breadth, less than four times as long as shortest (medial) breadth, teeth large, their apices equidistant, inner subapical swelling rounded; maxillary palpi about as long as greatest width of galea, four-segmented, second segment longest, third and fourth slightly shorter; first segment of labial palpus about 0.6 times as long as second. Punctuation of mesoscutum coarser than that of vertex, that of mesepisternum still more so; tegulae smooth, transparent testaceous. Legs black, tibial spurs brown. Wings slightly dusky, veins and stigma black. Abdomen black, posterior margins

of terga brownish, metasomal terga one to four with broad apical bands of white pubescence; sixth tergum and posterior portion of fifth pruinose; punctation fine, dense on fifth and sixth terga but sparser on others; scopa short, dull white.

Male: Length 6.5 mm. (6.0 to 6.8 mm. among paratypes). Similar in appearance and punctation to female but punctation of clypeus very fine and dense, face more densely covered with white pubescence; clypeal margin but little produced, edentate, slightly thickened and shining; inner orbits strongly diverging below. Mandibles tridentate, inner tooth much shorter than the others. Sixth metasomal tergum with posterior margin convex, with weak lateral lobes; seventh largely hidden, brown, margin with median notch. First sternum with posterior margin straight, second large, margin broadly rounded except for shallow, broad, median apical emargination, reaching to cover all but the apex of the fourth sternum; third sternum hidden, with broad, deep emargination which bears a fringe of long hairs medially; fourth sternum broadly rounded posteriorly, covering following sterna; sixth with small median notch in posterior margin; seventh with posterior margin broadly emarginate.

Holotype female, *allotype* male, and twenty-one male *paratypes*: COOPER'S STORE, BIG BEND NATIONAL PARK, TEXAS, on *Phacelia popei*, April 11, 1949 (R. H. Beamer, C. D. Michener); four female *paratypes*, twenty miles south of Marathon, Texas, on *Nama hispidum*, April 12, 1949 (R. H. Beamer, C. D. Michener).

This species is named for Doctor R. H. Beamer who helped collect the type series, in addition to many other interesting bees from Texas, Kansas, and elsewhere.

ASHMEADIELLA (ASHMEADIELLA) BUCCONIS DENTICULATA
Cresson, 1878

Cooper's Store, Big Bend National Park, Texas, April 11, 1949, (R. H. Beamer, C. D. Michener).

ASHMEADIELLA (ASHMEADIELLA) PROSOPIDIS (Cockerell), 1897

Hot Springs, Big Bend National Park, Texas, on *Prosopis juliflora*, April 11, 1949 (C. D. Michener, R. H. Beamer).

ASHMEADIELLA (ASHMEADIELLA) MELILOTI MELILOTI
(Cockerell), 1897

Sanderson, Texas, on *Dalea formosa*, April 13, 1949 (R. H. Beamer and C. D. Michener); Quemada, Texas, on *Dalea pogonathera*, April 14, 1949 (R. H. Beamer and C. D. Michener).

ASHMEALIELLA (ASHMEADIELLA) CACTORUM CACTORUM
(Cockerell), 1897

Twenty-five miles southeast of Dryden, Texas, on *Dalea argyraea*, April 13, 1949 (R. H. Beamer and C. D. Michener); Quemada, Texas, on *Dalea pogonathera*, April 14, 1949 (R. H. Beamer and C. D. Michener).

ASHMEADIELLA (ASHMEADIELLA) GILLETTEI Titus, 1904

Specimens of this species from western Texas and southern New Mexico are intermediate between the Great Plains form, *gillettei* (for which the synonym *coloradensis* was used by error in Michener, 1949, Jour. Kansas Ent. Soc., 22:45), and the form previously known as *A. rufiventris* Michener from the arid parts of California and Baja California. It is evident that *rufiventris* should be considered a subspecies of *gillettei*, and that a new subspecific name (*rubra*) should be proposed for the Texan population. The geographical variation can be described as follows:

Specimens from the plains east of the foot of the Rocky Mountains (Boulder and vicinity and Fort Collins, Colorado) and the single known specimen from South Dakota (Badlands National Monument) are rather coarsely punctate, with the mesocutum more coarsely punctate than the vertex. They are wholly black, or in less than half of the population at Boulder (the southernmost of the known great plains localities), there is red on the first two or three metasomal terga and on the posterior femora. This great plains population is properly known as *A. gillettei gillettei*.

Specimens from western Texas and southern New Mexico are about as coarsely punctate as is true *gillettei* but the abdomen is almost wholly red above, the posterior femora are red and the tibiae partly so. This population is to be known as *A. gillettei rubra*.

The populations from the deserts of California and Baja California are similar in coloration to *rubra* although often with more black on the apical portion of the abdomen. They differ from *rubra* particularly by the somewhat finer punctation, that of the mesoscutum being little if any coarser than that of the vertex. This subspecies is *A. gillettei rufiventris*.

A. gillettei ranges westward into the driest parts of cismontane southern California where it is represented by a population similar to *rufiventris* but having more black on the abdomen. In order to name this subspecies in connection with other forms of *gillettei*,

it is described below as *A. gillettei cismontanica*, even though it is not from Texas.

Ashmeadiella (*Ashmeadiella*) *gillettei rubra*

Michener, new subspecies

Female: Similar to typical *gillettei* but metasomal terga red except for dusky area on sixth, sterna largely red except for fifth and sixth which are black, posterior femora red and posterior tibiae red except for outer surface. Length 5 mm.

Male: Coloration similar to female but with median black areas on fifth and sixth terga (in some paratypes these terga black except for sides and posterior margins and median black areas present on third and fourth terga). Length 5 mm. (varying to 5.5 mm. among paratypes).

Holotype female: SANDERSON, TEXAS, on *Dalea formosa*, April 13, 1949 (R. H. Beamer, C. D. Michener). *Allotype* male and eight male *paratypes*: Rankin, Texas, April 10, 1949 (R. H. Beamer, C. D. Michener). These specimens were taken on the ground.

Additional male specimens, one from each locality, are from El Paso, Texas, April 6, 1902, and Mesilla Park, New Mexico, May 6, 1909.

Ashmeadiella (*Ashmeadiella*) *gillettei cismontanica*

Michener, new subspecies

Female: Similar to the subspecies *rufiventris* but with tegulae darker; hind tibiae usually with red on under surface only; first metasomal tergum red (or dusky along posterior margin in some paratypes); second and third terga red, black middorsally (or second wholly red); fourth and fifth terga red, only laterally (fourth sometimes with as much as lateral thirds red, fifth sometimes wholly black); sixth tergum black. Length 4.8 mm (to 5.9 mm.)

Holotype female and ten female *paratypes*: one and one-half miles west of PERRIS, CALIFORNIA, on *Heliotropium oculatum*, May 29, 1946 (P. H. Timberlake). One female *paratype*, same locality and collector, May 14, 1948, on *Cryptantha intermedia*. One female *paratype*, four and one-half miles west of Perris, California, on *Hugelia virgata*, May 14, 1948 (P. H. Timberlake).

The holotype and ten paratypes will be returned to the Timberlake collection, Citrus Experiment Station, Riverside, California. Two paratypes will be placed in the Snow Entomological Collection at the University of Kansas.

Ashmeadiella (*Ashmeadiella*) *truncativentris*

Michener, new species

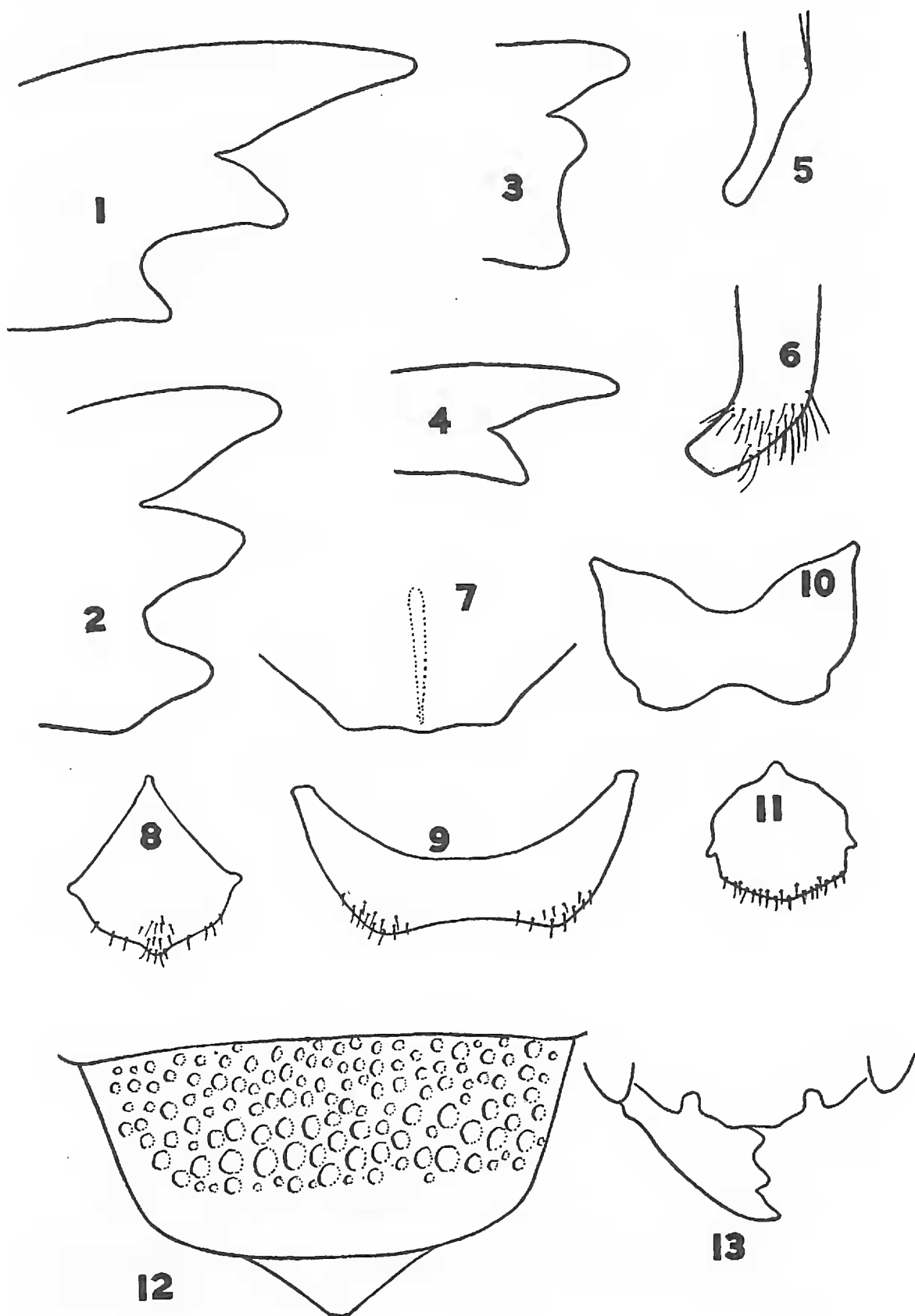
This striking species resembles *A. bigeloviae* Cockerell and its relatives in being black with the legs partly red. It differs, in the female, from *bigeloviae* as well as all other known species of *Ashmeadiella* by having a broad transverse shining subapical ridge across the sixth metasomal sternum, giving it the appearance of being broadly truncate. The hind tibial spurs are thick, black, and strongly curved as in *A. femorata* Michener and *A. titusi* Michener but they have more teeth than in these species, for which reason the male runs out at 2 in the key (Michener, 1939, Amer. Midland Nat., 22:12). The female differs from all species except *A. cactorum* (Cockerell) in lacking a smooth clypeal margin. The clypeus is flatter than in *cactorum*, which is an entirely unrelated and much smaller species.

Female: Length 7.5 mm. (6.0 mm. in paratype). Inner margins of eyes slightly converging below; facial line slightly shorter than transfacial; upper part of head and genal areas with punctures fine and close, becoming progressively coarser on lower part of supra-antennal area, supraclypeal area, and upper two-thirds of clypeus, being quite coarse and irregular and separated by shining ground in the latter area; lower third of clypeus with punctures very fine and dense, only an exceedingly narrow margin slightly raised and not conspicuously punctate; clypeal truncation slightly concave medially, demarked by rather distinct angles, slightly narrower than distance from its end to nearest eye margin; mandibles reddish subapically in paratype, distance from first to third tooth much less than greatest breadth of eye, nearly as great as length of last three antennal segments together; genal areas conspicuously narrower than eyes seen from side; anterior ocellus well behind midpoint between antennal bases and posterior edge of vertex; distance between posterior ocelli subequal to distance from one of them to eye, subequal to or greater than distance to posterior edge of vertex.

EXPLANATION OF FIGURES

1, Mandibular teeth of *Anthocopa beameri*, male. 2, Same, female. 3, Mandibular teeth of *Anthocopa daleae*, female. 4, Same, male. 5, Apex of male gonopod of *Anthocopa daleae*. 6, Same, *Anthocopa beameri*. 7, Clypeus, *Anthocopa daleae*, female. 8, Eighth metasomal sternum, *Anthocopa beameri*, male. 9, Seventh metasomal sternum of same. 10, Seventh metasomal sternum of *Anthocopa daleae*, male. 11, Eighth metasomal sternum of same. 12, Sixth metasomal sternum of *Ashmeadiella truncativentris*, female. 13. Clypeus and mandible of *Ashmeadiella clypeodentata simplicior*, female.

Mesoscutum with punctures small and dense, like those of vertex, anterior margin with weak pair of pubescent spots; punctures of mesepisternum markedly coarser and more widely separated than those of mesocutum or genal areas; tegulae black, distinctly punctured throughout; posterior femora and tibiae, middle femora, part of posterior trochanters, and undersides of middle tibiae red, hind tibial spurs black, strongly curved, outer spur with about eight teeth



on each margin, those of outer margin very low and oblique, inner spur with about nine teeth on each margin, those of outer margin very large and conspicuous, those of inner margin low. Abdominal terga more coarsely punctured than mesoscutum and except for the apical one less closely so; metasomal terga one to five with conspicuous apical bands of white hair, that on fifth weaker than the others; sixth tergum more broadly rounded than in most species; sixth sternum with basal half coarsely punctured, distal half impunctate and elevated to form a strong, slightly arcuate, subapical transverse ridge which is produced to each side to form distinct shoulders on the sternum.

Male: Length 6.2 mm. Similar to female in pubescence, punctuation, and structure, but clypeus not so coarsely punctate (though distinctly more coarsely so than vertex); anterior margin of clypeus with concavity, demarked by distinct angles and with an impunctate margin, this concavity about two-thirds as wide as upper width of clypeus; distitarsi rufescent and bases of posterior basitarsi red; hind tibial spurs with fewer teeth (outer margin of inner spur with about six large teeth) except for inner margin of inner spur which has ten or eleven teeth; lateral teeth of sixth tergum large and acute, median teeth longer than basal width, emargination between them deeper than a semicircle.

Holotype female, *allotype* male, and one female *paratype*: SANDERSON, TEXAS, on *Dalea formosa*, April 13, 1949 (R. H. Beamer, C. D. Michener).

Ashmeadiella (*Arogochila*) *clypeodentata simplicior*
Michener, new subspecies

Female: Differs from typical *clypeodentata* Michener by the weaker angles and emarginations of the median lobe of the clypeus, which is practically without a median emargination. Length 5.0 to 6.5 mm.

Holotype female and one female *paratype*: HOT SPRINGS, BIG BEND NATIONAL PARK, TEXAS, on *Prosopis juliflora*, April 11, 1949 (R. H. Beamer, C. D. Michener).

A. clypeodentata clypeodentata has been found only in the deserts of California and northwestern Mexico. The occurrence of the species in Texas is therefore interesting. It is of course possible that the Texan form is a different species but in view of the morphological similarity to the western form, this seems unlikely.

ASHMEADIELLA (AROGCHILA) EREMA Michener, 1939

A single female specimen was collected twenty-five miles southeast of Dryden, Texas, on *Dalea argyraea*, April 13, 1949 (R. H.

Beamer, C. D. Michener). This species was previously known only from the desert of eastern California. The Texan specimen differs from Californian ones in the broader dorsal black area of the abdomen.

ASHMEADIELLA (CHILOSIMA) RHODOGNATHA Cockerell, 1925

Cooper's Store, Big Bend National Park, Texas, on *Dalea neo-mexicana*, April 11, 1949 (C. D. Michener, R. H. Beamer). This species has not been known previously east of California and Baja California. The record is particularly interesting since it seems that *rhodognatha* is replaced in Arizona and New Mexico by the closely related form, *A. holtii* Cockerell. Unfortunately, only a single male specimen was obtained in Texas.

GELASTOCORIS ROTUNDATUS CHAMPION
IN CALIFORNIA

(Hemiptera: Gelastocoridae)

On February 24, 1951, a series of thirteen *Gelastocoris rotundatus* Champion¹ was taken by the writers on the bank of a small stream in Bennett Wash, eight miles southwest of Parker Dam, San Bernardino County, California. *G. rotundatus* is widely distributed in Mexico and Guatemala. Champion¹ remarks that this species "... will almost certainly be found to inhabit the Southern United States." Martin² records two specimens taken at Douglas, Arizona, in August, by F. H. Snow, and cites this as the first published record for the species in the United States.

G. rotundatus may be distinguished from all other members of the genus by means of the broadly convex, feebly sinuate pronotal margins, and by the male genitalia². The members of our series are relatively uniform in coloration, all being pale greenish above and brick-red on the abdominal sternites.

—P. A. ADAMS AND C. DON MACNEILL.

¹Champion, G. C., 1901, Biol. Centri.-Amer., Zoologia, Insecta, Rhynchota, Hemiptera-Heteroptera, 2:347, Tab. 20, fig. 18.

²Martin, C. H., 1928, Univ. of Kans. Sci. Bul., 18 (4):357, 363, pl. 58, fig. 16; pl. 59, fig. 8.